

## Claims

1. A process for preparing metal powders or metal  
hydride powders of the elements Ti, Zr, Hf, V, Nb, Ta  
and Cr, in which an oxide of these elements is mixed  
5 with a reducing agent and this mixture is heated in  
an oven, optionally under an atmosphere of hydrogen  
(in which case metal hydrides are formed), until the  
reduction reaction starts, the reaction product is  
leached and then the product is washed and dried,  
10 characterised in that the oxide used has a mean  
particle size of 0.5 to 20  $\mu\text{m}$ , a BET specific surface  
area of 0.5 to 20  $\text{m}^2/\text{g}$  and a minimum content of  
94 wt.%.
2. A process according to Claim 1, characterised in that  
15 the mixture is heated to 800 to 1400°C in an oven.
3. A process according to Claim 1 or 2, characterised in  
that the oxide used has a mean particle size of 1  
to 6  $\mu\text{m}$ .
4. A process according to one of Claims 1 to 3,  
20 characterised in that the oxide used has a BET  
specific surface area of 1 to 12  $\text{m}^2/\text{g}$ .
5. A process according to Claim 4, characterised in that  
the oxide used has a BET specific surface area of 1  
to 8  $\text{m}^2/\text{g}$ .
- 25 6. A process according to one of Claims 1 to 5,  
characterised in that the oxide used has a minimum  
content of 96 wt.%.
7. A process according to Claim 6, characterised in that  
the oxide used has a minimum content of 99 wt.%.
- 30 8. A process according to one of Claims 1 to 7,  
characterised in that the proportion of Fe and Al  
impurities in the oxide are each < 0.2 wt.%  
(calculated as the oxides).

9. A process according to Claim 8, characterised in that the proportion of Fe and Al impurities in the oxide are each  $< 0.1$  wt.% (calculated as the oxides).
- 5 10. A process according to one of Claims 1 to 9, characterised in that the proportion of Si impurities in the oxide is  $< 1.5$  wt.% (calculated as  $\text{SiO}_2$ ).
11. A process according to Claim 10, characterised in that the proportion of Si impurities in the oxide is  $< 0.3$  wt.% (calculated as  $\text{SiO}_2$ ).
- 10 12. A process according to one of Claims 1 to 11, characterised in that the proportion of Na impurities in the oxide is  $< 0.05$  wt.% (calculated as  $\text{Na}_2\text{O}$ ).
13. A process according to one of Claims 1 to 12, characterised in that the proportion of P impurities  
15 in the oxide is  $< 0.2$  wt.% (calculated as  $\text{P}_2\text{O}_5$ ).
14. A process according to one of Claims 1 to 13, characterised in that the loss on ignition of the oxide at  $1000^\circ\text{C}$  (constant weight) is  $< 1$  wt.%.
15. A process according to one of Claims 1 to 14,  
20 characterised in that the tamped down bulk density according to EN ISO 787-11 (previously DIN 53194) of the oxide is 800 to  $1600 \text{ kg/m}^3$ .
16. A process according to one of Claims 1 to 15,  
25 characterised in that a proportion of up to 15 wt.% of the oxide can be replaced by additives consisting of  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{Y}_2\text{O}_3$  or  $\text{CeO}_2$ .
17. A process according to one of Claims 1 to 16,  
30 characterised in that alkaline earth metals and/or alkali metals and/or hydrides of these are used as reducing agents.
18. A process according to Claim 17, characterised in that the Mg, Ca,  $\text{CaH}_2$  or Ba are used as reducing

agents.

19. A process according to one of Claims 1 to 18, characterised in that the reducing agent has a minimum content of 99 wt.%.
- 5 20. A process according to one of Claims 1 to 19, characterised in that the reaction is performed under a protective gas.
21. A process according to one of Claims 1 to 20, characterised in that the reaction product is leached  
10 with hydrochloric acid.